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Bibliography

- (19) [Country of Issue] Japan Patent Office (JP)
- (12) [Official Gazette Type] Open patent official report (A)
- (11) [Publication No.] JP,5-13131,A
- (43) [Date of Publication] January 22, Heisei 5 (1993)
- (54) [Title of the Invention] Shield equipment for an electric discharge cure type connector and connectors
- (51) [The 5th edition of International Patent Classification]
 - H01R 13/648 7331-5E
 - H05F 3/02 K 7028-5G
- [Request for Examination] Un-asking.
- [The number of claims] 2
- [Number of Pages] 4
- (21) [Filing Number] Japanese Patent Application No. 3-188327
- (22) [Filing Date] July 3, Heisei 3 (1991)
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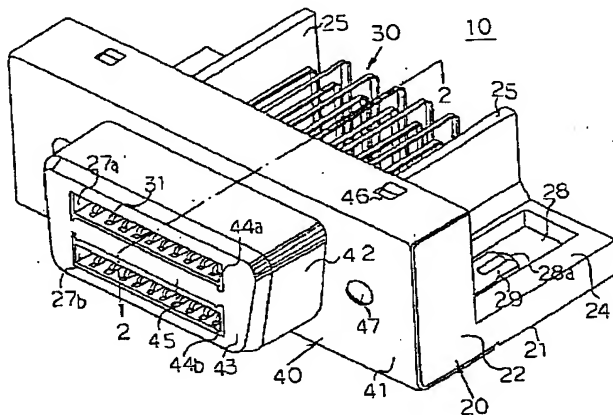
Summary

(57) [Abstract]

[Objects of the Invention] Offer the shield equipment for an electric discharge cure type connector and **** connectors which discharges for a terminal and does not destroy an electronic circuitry or a circuit element even if the body charged in high pressure approaches.

[Elements of the Invention] Not only the side attachment wall 42 of the fitting section 23 of the insulating housing 20 which has two or more contacts 30 of a train but the shield equipment 40 which has at least one bridge section 45 for electric discharge prevention between the terminal trains of the fitting side 26 at least is arranged. When an electrification body approaches a terminal 30, it discharges in the side attachment wall 42 or the bridge section 45 of shield equipment 40.

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CLAIMS

[Claim(s)]

[Claim 1] It is the electric-discharge cure type connector characterized by to be really has at least the bridge section by which the aforementioned shield equipment was formed between the aforementioned terminal trains of the aforementioned fitting section of the aforementioned connector in the connector of insulating housing with which the terminal of two or more trains was held at the fitting section, and this insulating housing which has wrap shield equipment in the fitting outside periphery the conductive metal plate of composition.

[Claim 2] Shield equipment for connectors characterized by being formed with the conductive metal plate which is shield equipment for multi-electrode connectors which the terminal of two or more trains is arranged and changes from a fitting side to a rear face, and has at least one bridge section formed in the wrap side attachment wall and the abbreviation center section between the aforementioned terminal trains of the aforementioned fitting side in the outside of the fitting section.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the shield equipment used for the shielded type electrical connector and it which have the terminal of a large number arranged at a multi-electrode electrical connector, especially two or more trains.

[0002]

[Description of the Prior Art] If it is in intelligent electronic equipment, such as computers, such as a personal computer and a word processor, and a peripheral device of those, two or more devices are turned a network (network) using a signal cable, and sending and receiving a signal mutually is becoming common. For that purpose, the I/O connector for interconnection is used for each electronic equipment. Since the number of I/O signals increases as the number of the devices which it uses like 8 bits, 16 bits, and 32 bits, the microprocessor to be used increasing, and ~~the~~ interconnecting increases with highly-efficient-izing of electronic equipment, a ~~the~~ I/O connector is in the inclination which the number of contacts (terminal) of a connector also increases increasingly. The number of contacts of a ~~the~~ I/O connector is not only several ten pieces but 100. What exceeds an individual is appearing.

[0003] The connector which has contact of ~~the~~ a large number cannot but become un-actual, and arranging contact to a single tier cannot but arrange it in two trains or two or more trains beyond it. Moreover, since these electronic equipment is used in the office generally carpeted, high static electricity is charged to an operator. Thus, if a connector is approached in order that the operator to whom high static electricity was charged may do the insert and remove of the connector, it will discharge in contact. The semiconductor device which uses MOS transistors, such as an element of the electronic circuitry connected to ~~the~~ contact, especially RATAMU access memory (RAM), is weak to static electricity.

[0004] If contact of a connector is a single tier, since static electricity of a human body will discharge to the shielding case which encloses the near periphery of contact, it hardly discharges in contact. However, if contact is arranged in two trains or two or more trains beyond it and the interval between contact trains becomes comparatively large, risk of discharging not in a shielding case but in contact will increase from an operator's human body charged in high static electricity.

[0005]

[Problem(s) to be Solved by the Invention] Then, this invention is to carry out the electrical connector which took the measures against electric discharge which have contact of two or more trains by easy composition, without discharging in contact, even if an operator's electric discharge charged in high static electricity arises. Moreover, it is in offering the shield equipment for ~~the~~ connectors.

[0006]

[The means and operation] for technical-problem solution According to the electric discharge cure type connector of this invention, the terminal of two or more trains is arranged toward the rear face from the fitting side of insulating housing. The portion between a wrap outer wall and the terminal train of a fitting side also covers the fitting outside periphery of this insulating housing with a conductive metal plate, and this metal plate is grounded.

[0007] Moreover, according to the shield equipment for connectors of this invention,

it forms with the metal plate of one sheet which has the bridge section which has a front face of a wrap and was formed [side / fitting / of a wrap outer wall and insulating housing] in the front face of the position corresponding to a terminal train between two or more slots or the terminal train in the periphery of insulating housing which has the terminal of two or more trains.

[0008] If an operator's finger which was charged in high-pressure static electricity according to the electrical connector which and was shielded approaches the terminal of a connector, high pressure will discharge in the front face or the bridge section of an outer wall or a slot periphery. [the electrical connector] [**** shield] Therefore, an electrical circuit, especially a semiconductor device, etc. which discharge for a direct terminal and are connected to it are not destroyed.

[0009]

[Example] Hereafter, with reference to the attached drawing showing the suitable example of this invention, it explains in detail. Drawing 1 is the perspective diagram of suitable 1 example of the electric discharge cure type connector of this invention, and drawing 2 is a cross section which meets the line 2-2 of drawing 1 .

[0010] With reference to drawing 1 and drawing 2 , the electric discharge cure type electrical connector 10 of this invention is constituted by the terminal 30 and the shield equipment 40 of the insulating housing 20 and a large number. This connector 10 is the so-called right-angled connector which has a right-angled fitting side to an anchoring substrate (not shown).

[0011] The insulating housing 20 has the base 22 perpendicular to the attachment (bottom) side 21, the fitting section 23 which projects from this base 22 to the front, the attachment section 24 of the back ends of a base 22, and the terminal protection septum 25 of two sheets. In plurality and this specific example, the terminal acceptance cavity 27 (namely, up cavernous 27a and lower cavernous 27b) of two trains is formed in the fitting section 23 toward the rear face from the front face or the fitting side 26. the attachment section 24 -- the upper surface -- a crevice 28 and through-hole 28a it forms -- having -- this through-hole 28a from -- a base 21 is projected -- the metal elastic maintenance foot 29 is formed preferably

[0012] Insertion maintenance of two or more terminals 30 is carried out through the breakthrough formed in the rear face from the fitting section 23 of the insulating housing 20. each terminal 30 -- HE in a cavity from the upper and lower sides of each cavity 27 -- the back from the rear face of the contact section 31 which has the contact of an approximate circle arc which projects a part, the attaching part 32 which has a varve (upside-down prickle), eats into the wall of the insulating housing 20, and is held, and the base 22 of the insulating housing 20 -- a protrusion -- it consists of the lead section 33 bent by the abbreviation right angle toward the anchoring substrate side or the base 21 The nose of cam of this lead section 33 carries out a predetermined length protrusion from the base 21 of the insulating housing 20 of a connector 10, and serves as a solder connection.

[0013] A terminal 30 is arranged at four trains, moreover, is shifted to a cross direction by turns, and is arranged in the shape of a reel so that clearly from drawing 2 . Since the terminal 30 of each train is the same size configuration, the position gap of the contact 34 position of the contact section 31 of a terminal 30 is carried out at the cross direction, and it is carrying out the position gap also of the solder connection of the lead section 33 by turns similarly in order. Consequently, the solder connection of the lead section 33 serves as about 8 train, and enables high-density arrangement. That is, in the cross-section position of drawing 2 , the lead section 33 of the terminal of vertical ends has shifted ahead, and the lead section 33 of two inside trains has shifted back. However, in the next cross-section position both, an inside terminal will be arranged ahead and the terminal of vertical both sides will be arranged back. Thus, by stagger arrangement of a terminal 30, while being able to attain densification of a terminal, it has the advantage in which the insertion force at the time of fitting with a partner connector can be fallen.

[0014] It is necessary to carry out alignment of the lead section, especially the solder connection of a terminal 30 of **** a large number, and for it to be right and to enable insertion of them at the through hole of an anchoring substrate. Therefore, the alignment board (or TAIN plate) 35 is used. This alignment board 35 forms a tapered bore 36 toward a base from the upper surface while making the upper surface stair-like, in order to do the insertion work of a solder connection easy. not illustrating, either — this alignment board 35 can be held between the septa 25 of the insulating housing 20

[0015] Shield equipment 40 is the metal plate of wrap integral construction about the base 22 and the fitting section 23 of the insulating housing 20. Preferably, a thin aluminum plate is manufactured by spinning. This shield equipment 40 of the point of projecting the front face of the base 22 of the insulating housing 20 from the wrap base 41 and its front face to the front, and having the wrap side attachment wall 42 for the periphery of the fitting section 23 is the same as conventional shield equipment. The shield equipment 40 of this invention is characterized by having the front-face section 43 of a wrap for a part of front face 26 of the fitting section 23 further. However, slot 44a for inserting in the position corresponding to the terminal acceptance cavity 27 of the front section 43 the terminal (circuit board which has two or more contact segments at the double-sided edge which serves as a male terminal in the example of illustration) of a partner connector and 44b It has. Slot 44a of the front section 43 of shield equipment 40, and 44b As for the central bridge section 45 of a between, it is desirable on workability, intensity, and a feeling of beauty to carry out folding of the side edge (edge) to back, as shown in drawing 2 , and to insert in the center section of the fitting side 26 of the fitting section 23 of the insulating housing 20 at formation *****.

[0016] Shield equipment 40 and the insulating housing 20 are fixed by engagement to two or more openings 46 formed in the vertical side of a base 41, and two or more salients formed in the base of the insulating housing 20. Of course, you may fix with

the fixed means of common knowledge of those other than this. Moreover, a tapped hole 47 is formed in the front ends of a base 41, and it attaches and grounds on a panel with a bolt etc.

[0017] Drawing 3 is the perspective diagram in which the example of the shield equipment 40 for connectors by this invention carried out simple. This drawing (A) It is substantially the same as the thing of drawing 1 and drawing 2. Namely, slots 44a and 44b It forms and is wrap structure except for the terminal acceptance cavity 27 about the fitting side 26 of the insulating housing 20. however, shield equipment 40 - the whole abbreviation surface of a fitting side - a wrap - things - not necessarily - not needing - the need - responding - a center section - bridge 45' This drawing (B) which it has like - you may be composition furthermore, two or more bridge section 45a to which the terminal acceptance cavity 27 corresponds three or more again at it in a certain case and 45b forming - natural (refer to this drawing (C)) Moreover, this invention is applicable also to arbitrary shield connectors other than a right angle.

[0018]

[Effect of the Invention] According to the electric discharge cure type connector of this invention, or the shield equipment for connectors, it approached along the front-face terminal acceptance cavity of the fitting section of insulating housing of a connector, and has left some shield boards. Therefore, since discharging for a terminal is prevented even if it brings close the operator and other high-pressure conductors which were charged in high pressure, discharge breakdown of a circuit can avoid effectively. Moreover, since shield equipment is formed in one by processing of a metal plate, special electric discharge cure structure is not needed and steep cost elevation is not produced as compared with the conventional shielded type connector.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective diagram of the suitable example of the electric discharge cure type connector by this invention.

[Drawing 2] The cross section which meets the line 2-2 of the electric discharge cure type connector of drawing 1 .

[Drawing 3] The simple perspective diagram showing the example from which the shield equipment by this invention differs.

[Description of Notations]

10 Electric Discharge Cure Type Connector

20 Insulating Housing

23 Fitting Section

26 Fitting Side

27 Terminal Acceptance Cavity

30 Terminal

40 Shield Equipment

42 Side Attachment Wall

45 45' Bridge section

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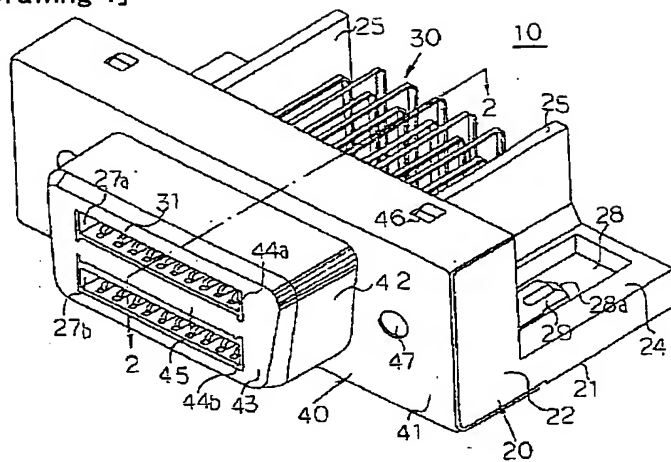
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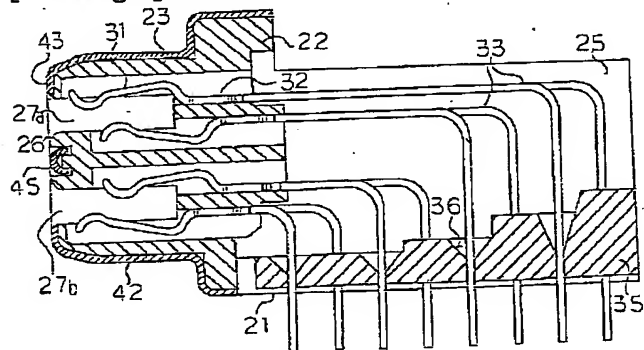
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DRAWINGS

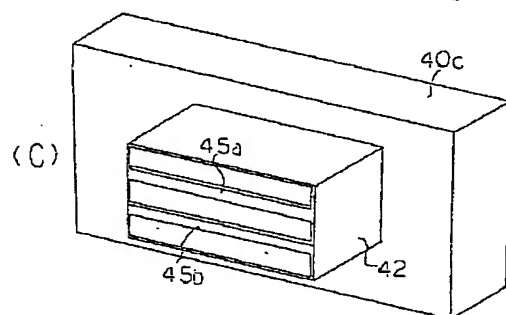
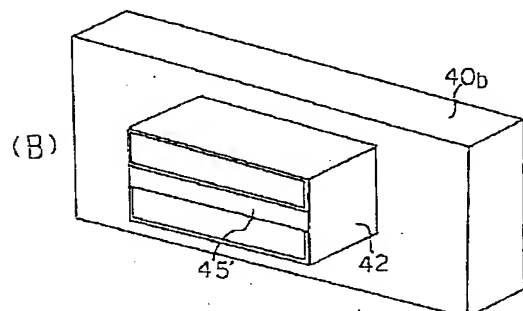
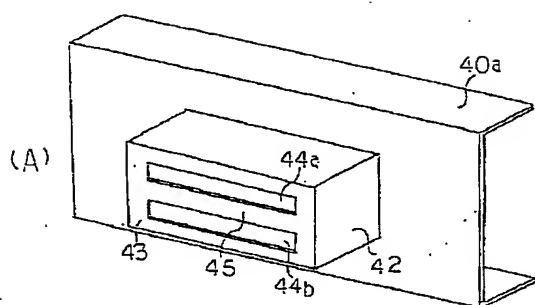
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]

(19)日本国特許庁(JP)

(12)公開特許公報(A)

(11)特許出願公開番号

特開平5-13131

(43)公開日 平成5年(1993)1月22日

(51)Int.Cl.⁵

H 0 1 R 13/648

H 0 5 F 3/02

識別記号

庁内整理番号

7331-5E

K 7028-5G

F I

技術表示箇所

審査請求 未請求 請求項の数2(全 4 頁)

(21)出願番号 特願平3-188327

(22)出願日 平成3年(1991)7月3日

(71)出願人 000227995

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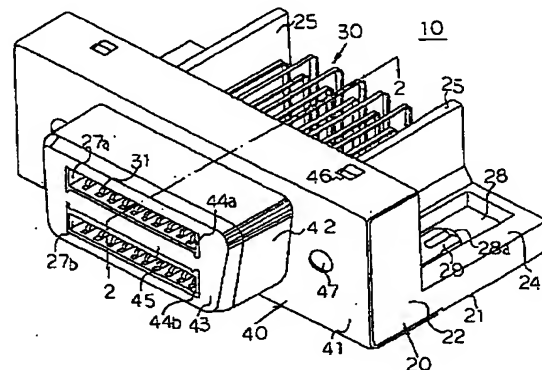
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(54)【発明の名称】 放電対策型コネクタ及びコネクタ用シールド装置

(57)【要約】

【目的】 高圧に帯電した物体が近づいても端子に放電し電子回路又は回路素子を破壊することのない放電対策型コネクタ及びスルコネクタ用シールド装置を提供すること。

【構成】 複数列のコンタクト30を有する絶縁ハウジング20の嵌合部23の側壁42のみならず少なくとも嵌合面26の端子列間に少なくとも1個の放電防止用ブリッジ部45を有するシールド装置40を配置する。端子30に帯電物体が近づくと、シールド装置40の側壁42又はブリッジ部45に放電する。



【特許請求の範囲】

【請求項1】 嵌合部に複数列の端子が保持された絶縁ハウジング及び該絶縁ハウジングの少なくとも嵌合部外周を覆うシールド装置を有するコネクタにおいて、

前記シールド装置は前記コネクタの前記嵌合部の前記端子列間に形成されたブリッジ部を有する一体構成の導電性金属板であることを特徴とする放電対策型コネクタ。

【請求項2】 嵌合面から後面に複数列の端子が配列されて成る多極コネクタ用シールド装置であって、嵌合部の外側を覆う側壁及び前記嵌合面の前記端子列間の略中央部に形成された少なくとも1個のブリッジ部を有する導電性金属板で形成されたことを特徴とするコネクタ用シールド装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、多極電気コネクタ、特に複数列に配置された多数の端子を有するシールド型電気コネクタ及びそれに使用するシールド装置に関する。

【0002】

【従来の技術】パーソナルコンピュータやワードプロセッサ等のコンピュータ及びその周辺機器等のインテリジェント電子機器にあっては複数の機器を信号ケーブルを用いて回路網（ネットワーク）化し、相互に信号の送受をするのが一般化しつつある。その為には各電子機器に相互接続用のI/Oコネクタを使用する。斯るI/Oコネクタは電子機器の高性能化に伴い、即ち使用するマイクロプロセッサが8ビット、16ビット、32ビットの如く増加し、且し相互接続して使用する機器の数が増加するにつれてI/O信号数が増加するので、コネクタのコンタクト（端子）数も益々増加する傾向にある。斯るI/Oコネクタのコンタクト数は数10個のみならず100個を

超すものも出現しつつある。

【0003】斯る多数のコンタクトを有するコネクタは、コンタクトを一列に配置するのは非現実となり、2列又はそれ以上の複数列に配置せざるを得ない。また、これら電子機器は一般にカーペットが敷かれたオフィスで使用される為に、オペレータには高い静電気が帯電する。このように高い静電気が帯電したオペレータがコネクタを挿抜する為にコネクタに近づくと、コンタクトに放電する。斯るコンタクトに接続されている電子回路の素子、特にラタムアクセスメモリ（RAM）等のMOSトランジスタを使用する半導体デバイスは静電気に弱い。

【0004】コネクタのコンタクトが例えば一列であれば、人体の静電気はコンタクトの近傍外周をとり囲むシールドケースに放電するのでコンタクトに放電することは殆どない。しかし、2列又はそれ以上の複数列にコンタクトを配列し、コンタクト列間の間隔が比較的大きくなると、高い静電気に帯電したオペレータの人体からシールドケースではなくコンタクトに放電する危険が増加

する。

【0005】

【発明が解決する課題】そこで、本発明は高い静電気に帯電したオペレータの放電が仮に生じてもコンタクトに放電することなく、且つ複数列のコンタクトを有する放電対策を施した電気コネクタを簡単な構成により実施することにある。また、斯るコネクタ用のシールド装置を提供することにある。

【0006】

【課題解決の為の手段及び作用】本発明の放電対策型コネクタによると、絶縁ハウジングの嵌合面から後面に向かって複数列の端子が配列されている。この絶縁ハウジングの嵌合部外周を覆う外壁と、嵌合面の端子列間の部分も導電性金属板で覆い、この金属板を接地する。

【0007】また、本発明のコネクタ用シールド装置によると、複数列の端子を有する絶縁ハウジングの外周を覆う外壁と絶縁ハウジングの嵌合面を覆う前面を有し、端子列に対応する位置の前面に複数のスロット又は端子列間に形成されたブリッジ部を有する一枚の金属板で形成する。

【0008】斯るシールド装置及びシールドされた電気コネクタによると、高圧静電気に帯電したオペレータの指等がコネクタの端子に近づくと、高圧は外壁又はスロット外周の前面又はブリッジ部に放電する。従って、直接端子に放電してそれに接続されている電気回路特に半導体デバイス等を破壊することはない。

【0009】

【実施例】以下、本発明の好適実施例を示す添付図を参照して詳細に説明する。図1は本発明の放電対策型コネクタの好適一実施例の斜視図であり、図2は図1の線2-2に沿う断面図である。

【0010】図1及び図2を参照して、本発明の放電対策型電気コネクタ10は絶縁ハウジング20、多数の端子30及びシールド装置40により構成される。このコネクタ10は取付け基板（図示せず）に対して直角である嵌合面を有する所謂直角コネクタである。

【0011】絶縁ハウジング20は取付（底）面21に垂直な基部22、この基部22から前方へ突出する嵌合部23、基部22の後方両端の取付部24及び2枚の端子保護隔壁25を有する。嵌合部23には前面又は嵌合面26から後面に向かって複数、この特定実施例では2列の端子受容空洞27、（即ち上部空洞27a及び下部空洞27b）が形成されている。取付部24には上面に凹部28及び貫通穴28aが形成され、この貫通穴28aから底面21を突出する好ましくは金属製弾性保持脚29が設けられている。

【0012】絶縁ハウジング20の嵌合部23から後面に形成された貫通孔を介して複数の端子30が挿入保持されている。各端子30は各空洞27の上下から空洞内へ一部突出する略円弧状の接点を有する接触部31、バンプ（逆さ上げ）を有し絶縁ハウジング20の内壁に食い込み保持され

る保持部32、絶縁ハウジング20の基部22の後面から後方に突出した後、取付け基板面又は底面21に向って略直角に折曲げられたリード部33より成る。このリード部33の先端はコネクタ10の絶縁ハウジング20の底面21から所定長突出して半田接続部となる。

【0013】図2から明らかな如く、端子30は4列に配置され、しかも交互に前後方向にシフトさせて千鳥足状に配置する。各列の端子30は同一寸法形状であるので、端子30の接触部31の接点34位置は前後方向に位置ずれしており、同様にリード部33の半田接続部も交互に前後に位置ずれしている。その結果、リード部33の半田接続部は前後8列となり、高密度配置を可能にする。即ち、図2の断面位置では上下両側の端子のリード部33が前方に、内側の2列のリード部33が後方にシフトしている。しかし、その隣の断面位置では内側の端子が共に前方に上下両側の端子が後方に配置されることとなる。このように端子30のスタガ配置により、端子の高密度化が図れると共に相手コネクタとの嵌合時の挿入力が低下できるという長所を有する。

【0014】斯る多数の端子30のリード部、特に半田接続部をアライメントし、取付け基板のスルーホールに正しく挿入可能にする必要がある。その為に、アライメント板（又はタインプレート）35を使用する。このアライメント板35は半田接続部の挿入作業を容易にする為に、上面を階段状とすると共に、上面から底面に向ってテーパー穴36を設ける。図示せずも、このアライメント板35は絶縁ハウジング20の隔壁25間に保持可能である。

【0015】シールド装置40は絶縁ハウジング20の基部22及び嵌合部23を覆う一体構造の金属板である。好ましくは、薄いアルミニウム板を絞り加工により製造する。このシールド装置40は絶縁ハウジング20の基部22の表面を覆う基部41、その前面から前方へ突出し嵌合部23の外周を覆う側壁42を有する点は従来のシールド装置と同様である。本発明のシールド装置40は、更に嵌合部23の前面26の一部を覆う前面部43を有することを特徴とする。但し、前面部43の端子受容空洞27に対応する位置には、相手コネクタの端子（図示の例では雄型端子となる両面端部に複数の接触片を有する回路板）を挿入する為のスロット44a、44bを有する。シールド装置40の前面部43のスロット44a、44b間の中央ブリッジ部45は図2に示す如く側縁（エッジ）を後方へ折曲げ加工して、絶縁ハウジング20の嵌合部23の嵌合面26の中央部に形成した溝内に挿入するのが作業性、強度及び美感上好ましい。

【0016】シールド装置40と絶縁ハウジング20とは基部41の上下側面に形成した複数の開口46と絶縁ハウジ

グ20の基部に形成した複数の突起との係合により固定する。勿論、これ以外の周知の固定手段で固定してもよい。また基部41の前面両端にはねじ穴47を形成し、ボルト等でパネルに取付け接地する。

【0017】図3は本発明によるコネクタ用シールド装置40の実施例の簡略した斜視図である。同図(A)は実質的に図1及び図2のものと同一である。即ち、スロット44a、44bを形成し絶縁ハウジング20の嵌合面26を端子受容空洞27を除き覆う構造である。しかし、シールド装置40は嵌合面の略全面を覆うことを必ずしも必要とせず、必要に応じて中央部のみにブリッジ45'を有する同図(B)の如き構成であってもよい。更にまた、端子受容空洞27が3以上ある場合には、それに対応する複数のブリッジ部45a、45bを形成すること勿論である（同図(C)参照）。また、本発明は直角以外の任意のシールドコネクタにも適用可能である。

【0018】

【発明の効果】本発明の放電対策型コネクタ又はコネクタ用シールド装置によると、コネクタの絶縁ハウジングの嵌合部前面端子受容空洞に沿い且つ接近してシールド板の一部を残している。従って、高圧に帯電したオペレータや他の高圧導電体を近づけても端子に放電することが阻止されるので、回路の放電破壊が効果的に回避可能である。また、シールド装置を金属板の加工で一体的に形成するので、別途の放電対策構造を必要とせず従来のシールド型コネクタに比して大幅なコスト上昇を生じることはない。

【図面の簡単な説明】

【図1】本発明による放電対策型コネクタの好適実施例の斜視図。

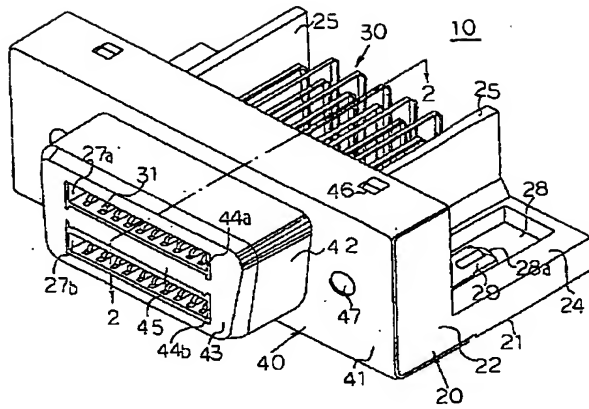
【図2】図1の放電対策型コネクタの線2-2に沿う断面図。

【図3】本発明によるシールド装置の異なる実施例を示す簡略斜視図。

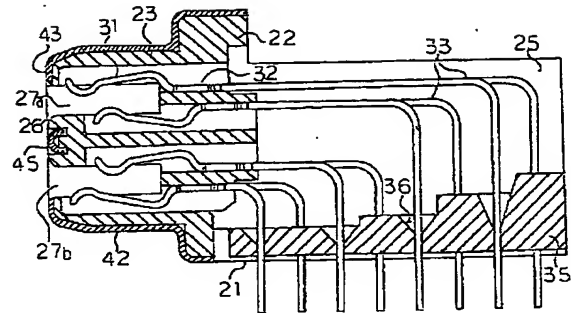
【符号の説明】

- | | |
|--------|-----------|
| 10 | 放電対策型コネクタ |
| 20 | 絶縁ハウジング |
| 23 | 嵌合部 |
| 26 | 嵌合面 |
| 27 | 端子受容空洞 |
| 30 | 端子 |
| 40 | シールド装置 |
| 42 | 側壁 |
| 45、45' | ブリッジ部 |

【図1】



【図2】



【図3】

